Name: Date:

Polynomial Factoring solution (version 663)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 10x + 30 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(1)(30)}}{2(1)}$$

$$x = \frac{-(10) \pm \sqrt{100 - 120}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{-20}}{2}$$

$$x = \frac{-10 \pm \sqrt{-4 \cdot 5}}{2}$$

$$x = \frac{-10 \pm 2\sqrt{5}\, i}{2}$$

$$x = -5 \pm \sqrt{5}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $8 - 4i$ and $-5 + 3i$ in standard form $(a + bi)$.**

Solution

$$(8 - 4i) \cdot (-5 + 3i)$$

$$-40 + 24i + 20i - 12i^2$$

$$-40 + 24i + 20i + 12$$

$$-40 + 12 + 24i + 20i$$

$$-28 + 44i$$

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3. **Write function $f(x) = x^3 - 7x^2 + 14x - 8$ in factored form. I'll give you a hint: one factor is $(x - 4)$.**

Solution

	1	-7	14	-8
4		4	-12	8
	1	-3	2	0

$$f(x) = (x-4)(x^2 - 3x + 2)$$

$$f(x) = (x-4)(x-1)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+2)^2 \cdot (x-3) \cdot (x-6)^2$$

Sketch a graph of polynomial $y = p(x)$.